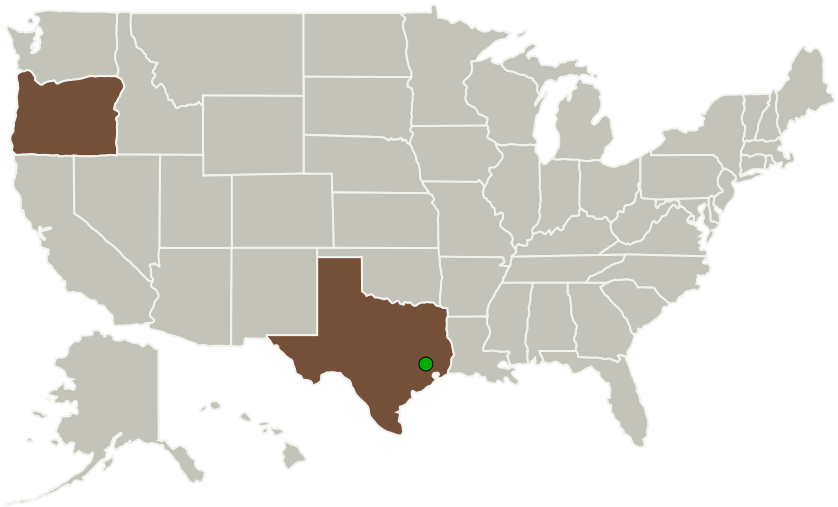
Continuous Brine Evaporation Cartridge, Phase I

Completed Technology Project (2015 - 2015)

Project Introduction

A microgravity-compatible Continuous Brine Evaporation Cartridge (CBEC) is proposed for greater than 95% water recovery from highly contaminated wastewater without concern for precipitation of organic and inorganic solids. The CBEC utilizes a small, counter flow evaporation chamber and heat exchange technologies, which reduce Equivalent System Mass (ESM) for water recovery via an evaporation system. A gas phase catalytic oxidizer converts organic contaminants in the moist air stream to carbon dioxide and water. The CBEC system dramatically lowers consumables and reduces long-term waste storage requirements compared to a traditional wick evaporation system. Highly contaminated wastewater streams such as urine, hygiene water, and RO brines are major wastewater streams for the CBEC. The Phase I project will focus on development of the counter flow wick evaporation cartridge and the catalytic oxidizer. The Phase II will incorporate thermal efficiency and mechanical durability to improve ESM of the CBEC system and result in delivery of 2 prototype systems, one large scale and the other for testing in microgravity. These efforts will be the foundation for the design and construction of a flight ready prototype for use on the International Space Station. The CBEC process will exceed the goal of 95% water recovery by 2022 set forth by NASA in the space technology roadmap.

Primary U.S. Work Locations and Key Partners



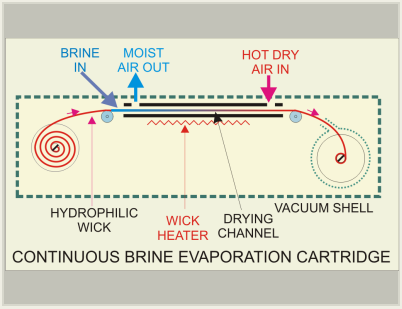


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Table of Contents

Small Business Innovation Research/Small Business Tech Transfer

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Organizations Performing Work	Role	Type	Location
UMPQUA Research Company	Lead Organization	Industry	Myrtle Creek, Oregon
Johnson Space Center(JSC)	Supporting Organization	NASA Center	Houston, Texas

Primary U.S. Work Locations	
Oregon	Texas

Project Transitions

June 2015: Project Start

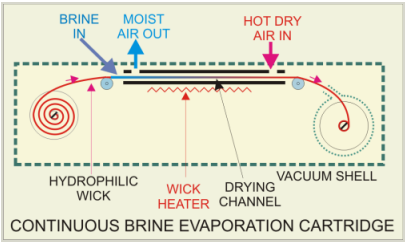
December 2015: Closed out

Closeout Summary: Continuous Brine Evaporation Cartridge, Phase I Project I mage

Closeout Documentation:

- Final Summary Chart Image*(https://techport.nasa.gov/file/138900)*

Images



Briefing Chart Image
Continuous Brine Evaporation Cartridge, Phase I
(https://techport.nasa.gov/image/126381)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
UMPQUA Research Company

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

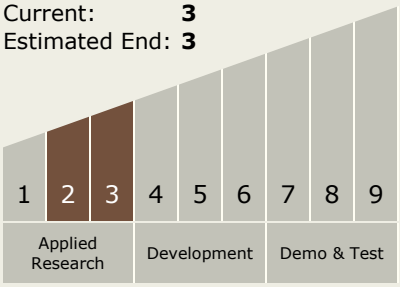
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
John O Thompson

Technology Maturity (TRL)

Start: **2**
Current: **3**
Estimated End: **3**



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Technology Areas

Primary:

- TX06 Human Health, Life Support, and Habitation Systems
  - TX06.1 Environmental Control & Life Support Systems (ECLSS) and Habitation Systems
    - TX06.1.2 Water Recovery and Management

Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System